



## **Vinyl 2010 Progress Report 2008**

Reporting on the activities of the year 2007



The European PVC Industry's Sustainable Development Programme

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# EXECUTIVE SUMMARY

## ► The Progress Report, the Voluntary Commitment and Vinyl 2010

Sustainable Development and product stewardship across the life cycle of PVC have inspired the approach of the European PVC industry's Voluntary Commitment since its origin in 2000. Vinyl 2010 is the organisation set up to put the Commitment into practice minimising the environmental impact of the PVC production, promoting a responsible use of additives, supporting collection and recycling schemes, and encouraging the social dialogue with all stakeholders. The Progress Report is Vinyl 2010's annual review of progress towards the concrete and measurable targets set out in the Voluntary Commitment.

## Developments in 2007

Closer to the symbolic date of 2010, Vinyl 2010 concentrated its efforts in 2007 towards the achievement of its targets, particularly in terms of collection and recycling, with a further substantial increase of recycled volumes of PVC waste. But Vinyl 2010 is also becoming more and more of a reference point on material and product sustainability for the whole of the PVC industry, providing guidelines and sharing knowledge and best practices. Life-cycle approach and stakeholder dialogue have been confirmed to be key elements for the success of Vinyl 2010 as well as the commitment of the whole of the PVC industry value chain.

## ► Resin Manufacturing

In 2007, based on the latest PVC Eco-Profiles, the PVC industry developed and published Environmental Product Declarations (EPDs) for Suspension-PVC (S-PVC) and Emulsion-PVC (E-PVC). These documents provide a clear and objective picture of the environmental performance data with suitable indicators, for example on greenhouse gas emissions, as well as additional information on health implications and performance aspects.

This data will help industry, academic and other third parties in defining subsequent profiles and assessments.

## ► Plasticisers

Following the publication of the EU risk assessments on the most commonly-used phthalate plasticisers diisononyl phthalate (DINP), diisodecyl phthalate (DIDP), dibutyl phthalate (DBP) and di-(2-ethylhexyl) phthalate (DEHP), ECPI (the European Council for Plasticisers and Intermediates) has undertaken a major study on human volunteers. The purpose of the study is to define the best methodology in order to correctly measure DEHP and DINP metabolites in humans, and therefore the levels of acceptable exposure.

## ► Stabilisers

ESPA (the European Stabiliser Producers Association) continued the progressive lead replacement (-34% in the period 2000-2007 in the EU-15), confirmed by the corresponding increase of the use of calcium-based stabilisers. In 2007 the commitment of 100% phase-out by 2015 was also extended to the EU-27.

Following the EU enlargement, the phase-out of cadmium was actually completed in the EU-27 by the end of 2007.

## ► Waste Management Projects

In 2007, 149,463 tonnes of post-consumer PVC waste were recycled through Vinyl 2010 projects, an 80% increase on 2006 levels.

Recovinyl (the organisation set up in 2003 with the aim of supporting and developing PVC waste collection and recycling schemes) has progressively integrated the collection and recycling initiatives previously directly managed by the EuPC sectoral projects.

In 2007, Recovinyl increased its activities in several European countries and confirmed the effectiveness of the process with a huge increase of registered recycled volumes reported: from 44,690 tonnes in 2006 to 111,322 tonnes in 2007.

Some highlights from other Vinyl 2010 sectoral projects were:

- EPPA (the European PVC Window and Related Building Products Association) has progressively integrated its recycling activities in Recovinyl. Overall the recycling of window profiles and window-related profiles reached 56,046 tonnes (+ 51%) in 2007.
- TEPPFA (the European Plastic Pipes and Fittings Association) has integrated most of its activities into the Recovinyl system. Overall the recycled volumes for pipes and fittings almost doubled in 2007, reaching 21,236 tonnes.
- ESWA (the European Single Ply Waterproofing Association) recycled 6,627 tonnes through its project ROOFCOLLECT®, well exceeding its target of 2,520 tonnes.
- EPFLOOR (the European PVC Floor Manufacturers Association) increased both collection (by 24%) and recycling (by 16%) volumes in 2007, with a final result of 2,054 tonnes recycled, close to the target of 2,200 tonnes.
- EPCOAT (EuPC's PVC Coated Fabrics) faced several challenges such as the quality of available waste with a lower percentage of PVC used in coated fabrics and increases in gate fees of some recycling plants. This affected the volumes of recycling achieved, with a total of 2,609 tonnes being achieved for the year.





## ► Recycling Technologies and Trial Plants

Vinylloop® is a mechanical recycling technology based on separation by the use of solvents, operating in a plant at Ferrara, Italy. In 2007, the plant further improved its performance, processing 8,191 tonnes of PVC waste, almost 14% over the target.

The gasification plant technology for waste demonstrated by the German company Sustec Schwarze Pumpe GmbH (SVZ), did not convince the market because of the existence of cheaper solutions, and in 2007 SVZ ceased operations.

Vinyl 2010 is currently exploring the possible use in Europe of a feedstock recycling process based on Sumitomo Metal gasification technology. The first step was the identification of a suitable location for a potential 30kt plant in Europe. At the moment some locations found in Germany are under evaluation.

## ► Other Projects

REACH – Following the recommendation of the Monitoring Committee, Vinyl 2010 will initiate an impact assessment of possible options to reconcile recycling of waste containing certain types of additives with the restriction provisions of the REACH regulation.

The Vinyl Foundation is the new initiative set up by EuPC with the assistance of Vinyl 2010 to collect funding contributions, in a fair and equitable way, from all PVC converters, including those not represented in the industry associations. It is a non-profit independently-managed trust. The accountancy firm KPMG has been appointed to operate a confidential ‘black box’ system and independently administrate the collection of funds on behalf of the Vinyl Foundation. KPMG will handle all the information collected in the strictest confidence, in full compliance with the EU competition laws.

## Monitoring, Access to Information and Stakeholder Relations

### ► Guidance from the Monitoring Committee

The Monitoring Committee is the independent body set up to check the progress of the Vinyl 2010 programme.

The Monitoring Committee is formally called twice a year under the chairmanship of Professor Alfons Buekens of the Free University of Brussels (VUB).

### Finance

Expenditure by Vinyl 2010, including EuPC and its members amounted to €7.68 million in 2007, up from €7.09 million in 2006.

### ► Independent Auditors

Vinyl 2010 is committed to transparency and has engaged independent auditors and verifiers.

- The financial accounts of Vinyl 2010 were audited and approved by KPMG.
- KPMG also audited the statement of tonnages of products recycled.
- The Progress Report 2008 was reviewed by DNV and verified as giving a true and honest representation of Vinyl 2010's performance and achievements.

## ► Encouraging Dialogue with Stakeholders

An ongoing dialogue is an important component for Vinyl 2010 if it is to represent the interests of its stakeholders both inside and outside the industry. In 2007, Vinyl 2010 participated in several international conferences and exhibitions, reinforcing the network of relationships with the scientific and academic community, with the authorities, and with the rest of the industry. The partnership between Vinyl 2010 and the other PVC regional associations, from North to South America, from Australia to the Asia-Pacific region is of great importance.

In 2007 Vinyl 2010 launched its first Sustainable Development Essay Competition intended to engage young European people on the issues surrounding this very topical subject.

The Essay Competition with the theme '*Are sustainable development and economic growth mutually exclusive?*' was judged by an independent Judging Panel of European sustainable development experts. The full set of entries has been published at [www.vinyl2010.org](http://www.vinyl2010.org).

To provide a forum for the exchange of views about its strategy, programme and initiatives, Vinyl 2010 hosted events during 2007 specifically dedicated to its stakeholders. The first Stakeholder Networking Event was held in the European Parliament Members' Dining Room, to present the Annual Report. A second Stakeholder Networking Event was organised in Brussels to officially introduce the new Vinyl Foundation.

Since 2004 Vinyl 2010 has been a registered Partnership with the Secretariat of the UN Commission on Sustainable Development.

Vinyl 2010 Progress Reports and Executive Summaries, published since 2001, can be downloaded from [www.vinyl2010.org](http://www.vinyl2010.org).

## Key Achievements 2000-2007

- Recycled tonnages increasing exponentially: 14,255 tonnes in 2003, 18,077 tonnes in 2004, 38,793 tonnes in 2005, 82,812 tonnes in 2006 and 149,463 tonnes in 2007
- Publication of Environmental Declarations (EPD) for S-PVC and E-PVC (2007)
- Cadmium stabilisers phase-out completed in the EU-15 (2001), EU-25 (2006) and EU-27 (2007)
- Lead stabiliser phase-out by 2015 extended to the EU-25 (2006) and EU-27 (2007)
- Phthalate risk assessments completed (2005-2006) and published (2006-2007)
- Risk assessment on lead stabilisers published (2005)
- 15% reduction in lead stabiliser use achieved ahead of time (2005)
- External verification of ECVm S-PVC and E-PVC production charters (2002 and 2005 respectively)
- Registration of Vinyl 2010 as a Partnership with the Secretariat of the UN Commission on Sustainable Development (2004)
- 25% recycling of pipes, windows and waterproofing membranes (2003)
- Bisphenol A phased out of PVC resin production in all ECVm member companies (2001)



# THE EUROPEAN PVC INDUSTRY

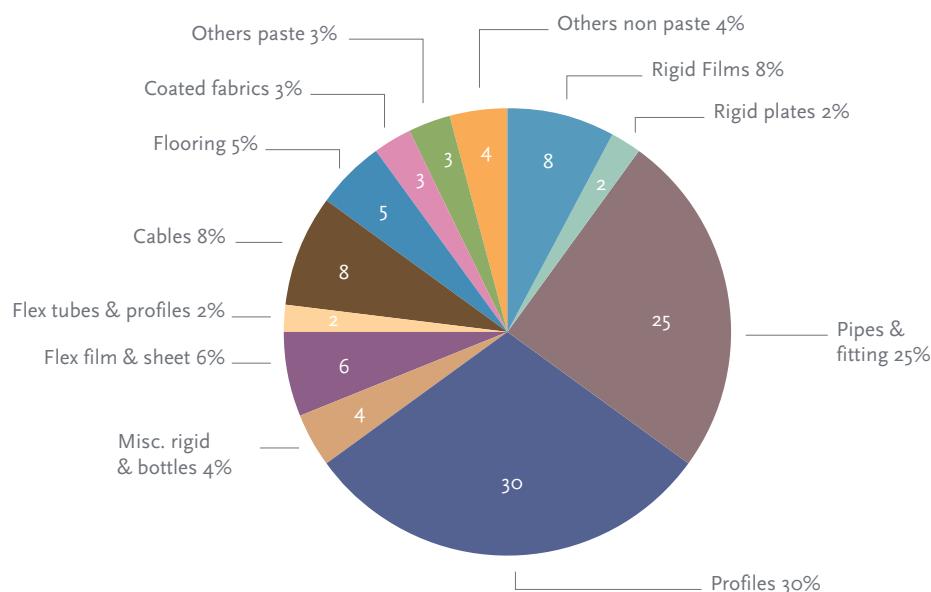
PVC is one of the most used plastic materials in the world. At global level, demand for PVC exceeds 35 million tonnes per annum and it is in constant growth (+5% on global average), with higher growth rates in the developing countries.

In Europe (EU-27), the production of PVC products – including exports – totals about 8 million tonnes per year. European PVC resin consumption totals some 6.5 million tonnes per year, or 15% of all plastics use in Europe, with an average growth of 2-3% per year.

The European PVC chain, from resin and additive manufacture to the final product, involves more than 23,000 companies – of which many are Small and Medium Sized Enterprises – and approximately 530,000 people.

In Europe the PVC industry is represented by the four associations ECVN (the European Council of Vinyl Manufacturers), ESPA (the European Stabilisers Producers Association), ECPI (the European Council for Plasticisers and Intermediates), and EuPC (the European Plastic Converters).

## PVC Sales in Western Europe and Czech Republic, Hungary, Poland and Slovakia in 2007





## VINYL 2010 AND ITS VOLUNTARY COMMITMENT

Vinyl 2010 is the legal entity which provides the organisational structure and financial resources to implement the European PVC industry's Voluntary Commitment. This is a 10-year plan, with verifiable objectives and quantifiable targets, to progress the PVC industry toward sustainability by improving production processes and products, investing in technology, minimising emissions and waste, and boosting collection and recycling.

The Voluntary Commitment was set up by the four associations representing the European PVC industry and originally signed in March 2000. As planned from the beginning, the Voluntary Commitment was reviewed and revised in 2005 to take into account practical experience, technical progress and the enlargement of the European Union, and it is now rolled-out across the EU-27. The commitment on cadmium and lead stabilisers was also extended to the EU-27.

Sufficient investment is essential to underpin the PVC industry's commitments. For this reason ECVM, ESPA and EuPC member companies provide, directly and indirectly, the amounts necessary to execute the specific projects agreed upon by the Vinyl 2010 Board with contributions from ECPI.

Vinyl 2010 closely involves stakeholders and policy-makers, with an independent Monitoring Committee, in the implementation of the Voluntary Commitment. The Committee currently includes representatives from the European Parliament, the European Commission, trade unions and consumers' associations. Vinyl 2010 hopes to enlarge representation and welcomes participation by environmental NGOs.

Vinyl 2010 is committed to providing detailed information and to transparency. Independent third parties are chosen by the Monitoring Committee to verify and evaluate achievements.

The Progress Report is Vinyl 2010's annual review of progress towards the targets set out in the Voluntary Commitment.

### Vinyl 2010 Board

**Mr. David Clark** – *Board Member* (Flexible PVC sector)

**Mr. Alexandre Dangis** – *Board Member* (EuPC)

**Dr. Brigitte Dero** – *Board Member* (ESPA)

**Mr. Jean-Pierre De Grève** – *Secretary General* (ECVM)

**Mr. Joachim Eckstein** – *Vice Chairman* (EuPC)

**Dr. Josef Ertl** – *Chairman* (ECVM)

**Mr. Marc Gillin** – *Board Member\** (ECVM)

**Mr. Henk ten Hove** – *Board Member* (Rigid PVC sector)

**Dr. Arno Knebelkamp** – *Board Member\*\** (ECVM)

**Mr. Ashley Reed** – *Board Member* (ECVM)

**Dr. Michael Rosenthal** – *Treasurer* (ESPA)

\* until June 2007

\*\* from June 2007



## FOREWORD

*Vinyl 2010's experience shows that sustainability is not just a fashionable word, but it also represents concrete issues, real challenges, scientific solutions, technological innovations and learning by doing, as well as effort and commitment. The whole European PVC industry is committed to sustainable development, in its everyday life and work; and this report once again demonstrates an industry taking responsibility.*

*We are particularly proud to announce that practically all the manufacturers of European PVC resin are now represented in ECVN and committed to sustainable development. With the entrance of the Central European producers, ECVN now represents more than 99% of PVC production capacity in the European Union. This is a great result and a prerequisite for further success. ECVN is now one of the most representative associations in the EU, a true example of European integration.*

*2007 was a demanding year. We all contributed to take on the new challenges that not only the PVC, but the entire plastics and chemical industry must address. And will continue to do so. The REACH regulation is one of the most important of these new challenges.*

*We are convinced that the considerable amount of studies, research and risk assessment on PVC additives and other substances the PVC industry has already carried out will contribute to the implementation of REACH, making it a real instrument of confidence for European citizens.*

*The progressive substitution of lead stabilisers is being successful in most countries within the EU-15 and we would like to thank everybody in the industry for their enormous technical and financial efforts. These will pay off in the future. However, the progress for the EU-27 towards its final target to completely phase out lead by 2015 will require a great effort also from the other EU members.*

*Collection and recycling schemes are at the core of the Vinyl 2010 sustainable development programme. The progressive integration of sectoral projects into Recovinyl and the hard work done to develop synergies, enlarge the geographic scope, involve external recyclers and waste management companies, once again produced an impressive growth in PVC collection and recycling in 2007.*

*Vinyl 2010 believes that the Recovinyl system significantly contributes to make PVC recycling a mainstream and market-driven activity. The road, however, is still long and ever more demanding in terms of economic and human resources. A significant part of the PVC industry is already heavily contributing to the funding of Vinyl 2010 collection and recycling schemes and we strongly encourage everybody who is not contributing yet to share the industry's joint responsibility.*

*To provide the funding that will enable Vinyl 2010's collection and recycling schemes to reach their full potential, the European Plastics Converters (EuPC) has established the Vinyl Foundation, a new payment mechanism with the potential to collect contributions equitably from this part of the PVC value chain. The success of the Vinyl Foundation initiative will be key to the achievement of Vinyl 2010's targets and we are confident that all PVC converters in Europe will take responsibility and commit to support this initiative.*

*Finally, I want to thank the members of the Vinyl 2010 Monitoring Committee for their valuable advices and indispensable contribution to the Voluntary Commitment's implementation.*

*Industry responsibility is the rationale behind Vinyl 2010. By working together we are making the sustainable development of PVC a reality. Be part of the future of PVC!*



Josef Ertl, Chairman Vinyl 2010

## STATEMENT FROM THE CHAIRMAN OF THE MONITORING COMMITTEE

*Since 2003, I have had the honour of chairing the Vinyl 2010 Monitoring Committee. This year we saw many things evolve, including the involvement of the Committee members in Vinyl 2010 initiatives and events outside the Monitoring Committee formal meetings.*

*This shows that Vinyl 2010 is becoming more and more concrete and credible for all its stakeholders. And I consider this a real success.*

*This year the Monitoring Committee welcomed the introduction of the first ever Stakeholder events initiative. This initiative enhances the transparency of the industry by providing a forum for the free expression of various perspectives, some of which possibly differing from ours, as we experienced in April 2007, with a frank and constructive exchange of views.*

*My colleagues on the Monitoring Committee and I continue to verify the efforts of the PVC industry, where it is succeeding very well and also where it is still facing challenges. It is important that Vinyl 2010 is set up as a pragmatic 'learning gradually by doing' process, and when some projects did not deliver the expected results convincingly, alternatives were promptly proposed and evaluated.*

*In our view, the European PVC industry has done well with its Vinyl 2010's commitment up to now. However, the targets are still clearly challenging. Our available 'means' seem rather adequate, but necessarily remain limited, as the Voluntary Commitment cannot address all potential issues at the same time for introducing and attaining a sustainable industry of the future. It is therefore important that the European PVC industry should also engage in a wider debate with the global PVC industry and with the chemical industry as a whole, in order to achieve a true long-term sustainable development programme.*



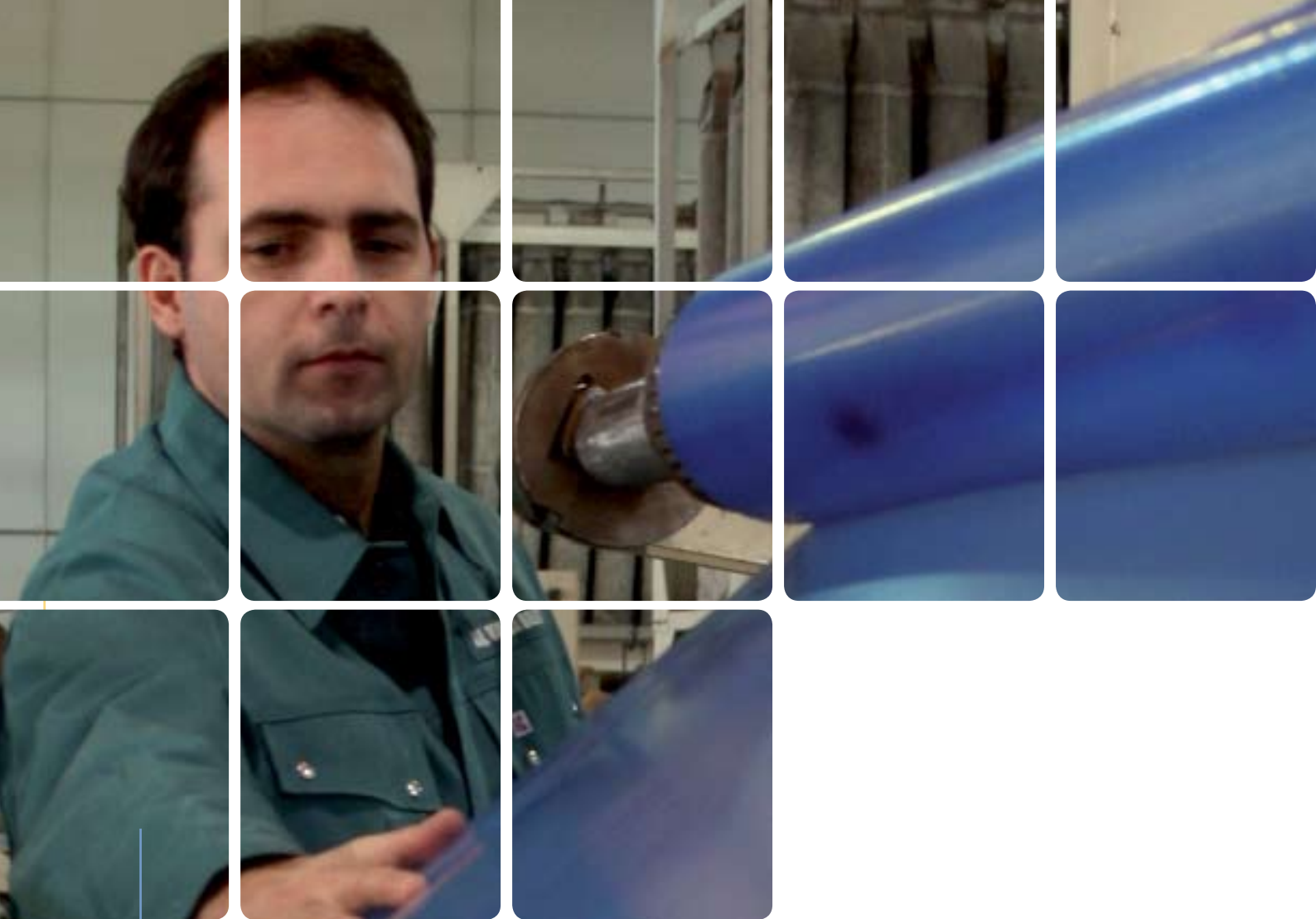
*As the year 2010 approaches, it is clear that Vinyl 2010 is in sight of reaching its targets but inevitably the final stretch will be the most challenging to achieve. Fortunately, results from Recovinyl and the other ongoing recycling projects are promising in terms of volumes. Costs per unit tend to decline. We will watch with interest the development of the new Vinyl Foundation funding mechanism as its implementation appears to be key to completing the success of Vinyl 2010.*

*We are optimistic about Vinyl 2010 meeting its targets by 2010, but it is also pleasing to see that the PVC industry recognises that on the road to sustainability this will just be the beginning and it is already discussing what will succeed – in a few years – Vinyl 2010.*

A handwritten signature in white ink, appearing to read 'Alfons Buekens'.

*Alfons Buekens, Chairman of the Monitoring Committee*





# Balázs

Works Manager  
Hungary



Weather-proof environment

## WORKING TOGETHER

### The Vinyl 2010 Monitoring Committee

The Monitoring Committee is the independent organism set up in 2003 to guarantee openness, effectiveness and good governance in the implementation of the Voluntary Commitment. Its members, chaired by Professor Alfons Buekens of the VUB<sup>1</sup>, currently include senior representatives from the European Commission, the European Parliament, consumer organisations, trade unions and representatives of the PVC industry associations grouped in Vinyl 2010.

The Committee is open to other stakeholders and third parties, such as Environmental NGOs, with the objective of promoting a wider dialogue towards PVC sustainable development.

The Monitoring Committee is formally called twice a year to check the progress of the Vinyl 2010 programme.

The minutes of the Monitoring Committee are public and are published on the Vinyl 2010 website ([www.vinyl2010.org](http://www.vinyl2010.org)).

### Members

- Mr. Klaus Berend**, *European Commission, Directorate General Enterprise*
- Professor Alfons Buekens**, *VUB, Chairman of the Monitoring Committee*
- Dr. Jorgo Chatzimarkakis**, *Member of the European Parliament, Industry, Research and Energy Committee*
- Mr. Alexandre Dangis**, *Managing Director of EuPC*
- Mr. Jean-Pierre De Grève**, *Secretary General of Vinyl 2010*
- Dr. Brigitte Dero**, *Secretary General of ESPA*
- Mr. Joachim Eckstein**, *Vice Chairman of Vinyl 2010*
- Dr. Josef Ertl**, *Chairman of Vinyl 2010*
- Mrs. Karolina Fras**, *European Commission, Directorate General Environment\**
- Mr. Patrick Hennessy**, *European Commission, Directorate General Enterprise*
- Mr. Timo Mäkelä**, *European Commission, Directorate General Environment*
- Mr. John Purvis**, *Member of the European Parliament, Industry, Research and Energy Committee*
- Mr. Reinhard Reibsch**, *EMCEF<sup>2</sup>*
- Mr. Carlos Sanchez-Reyes de Palacio**, *OCU<sup>3</sup>*
- Mr. Maik Schmahl**, *European Commission, Directorate General Enterprise*

*\* until December 2007*



<sup>1</sup> VUB: Free University of Brussels ([www.vub.ac.be](http://www.vub.ac.be))

<sup>2</sup> EMCEF: European Mine Chemical and Energy Workers Federation ([www.emcef.org](http://www.emcef.org))

<sup>3</sup> OCU: Organización de Consumidores y Usuarios (Spanish Consumers and Users Organisation) ([www.ocu.org](http://www.ocu.org))

## European Union Enlargement

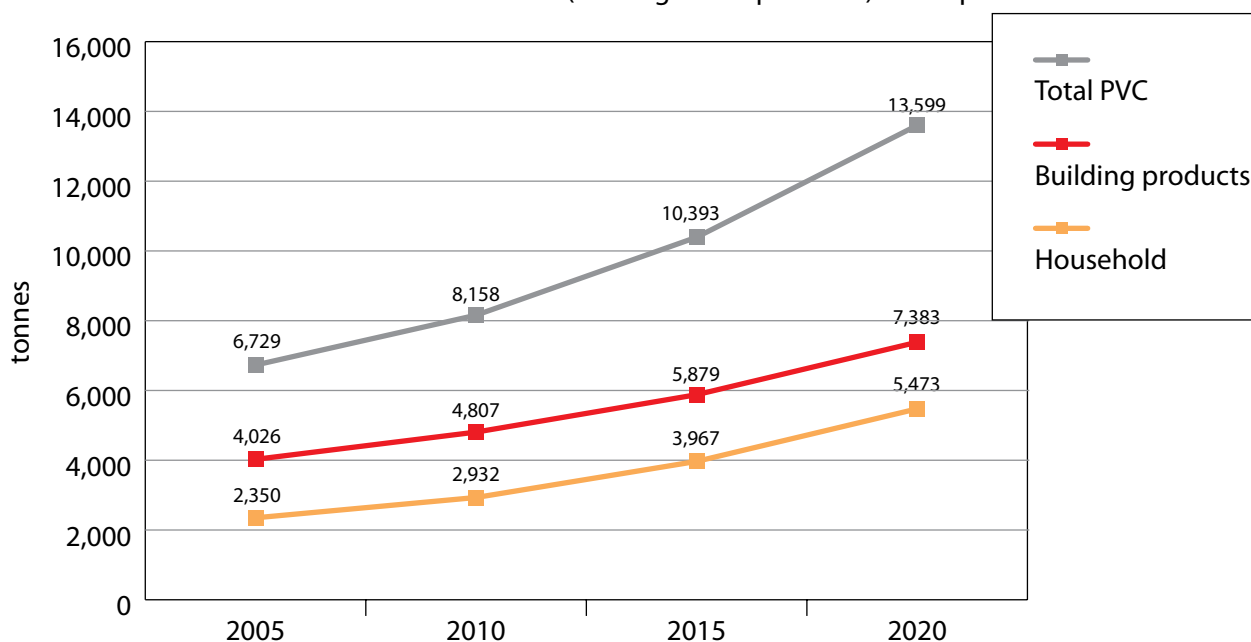
The progressive integration of the new EU Member States in the Voluntary Commitment is well on track. A major achievement in 2007 was the decision of all the Central European PVC manufacturers which were not members yet, to join ECVM<sup>4</sup>, whose members are now responsible for 99% of the European Union PVC production. This means, in particular, that the new members are committed to achieving the demanding ECVM targets in terms of health and safety requirements and minimisation of the environmental impact of the PVC production sites. The organisation of the ECVM General Assembly in Budapest in 2007 symbolically confirms the advanced process of integration.

Concerning the extension of the Voluntary Commitment targets to the new EU Member States, the phasing-out of cadmium-based stabilisers was completed in the EU-25 in 2006 and in the EU-27 in 2007, and the phase-out commitment of lead stabilisers by 2015 was extended to the EU-27.

## EuPC Post-Consumer Waste Studies in Eastern Europe

Following the recommendation of the Monitoring Committee in 2007, EuPC<sup>5</sup> carried out a study to estimate the trend of post-consumer PVC waste volumes for the period 2005-2020 in Slovakia, to complement the previous two studies on Hungary and Poland reported on in 2007. The Slovakia study is based on the EuPC model and considers parameters such as historical PVC production, future market growth, import and export, availability and collectability of waste. The study estimates a growing trend for waste in Slovakia, especially from building and household PVC waste.

Slovakia Available Post-Consumer PVC Waste (non regulated products) – Comparison 2005 till 2020



<sup>4</sup> ECVM: European Council of Vinyl Manufacturers ([www.pvc.org](http://www.pvc.org))

<sup>5</sup> EuPC: European Plastics Converters ([www.plasticsconverters.eu](http://www.plasticsconverters.eu))



## Stakeholder Dialogue

An ongoing dialogue is an important component for Vinyl 2010 if it is to represent the interests of its stakeholders both inside and outside the industry. A frank exchange of views on studies, experiences and good practice gives added value to improving the effectiveness of the initiatives taken through the Voluntary Commitment. In 2007, Vinyl 2010 reinforced the network of relationships with the scientific and academic community, with authorities, and with the rest of the industry.

Today the road to sustainable development cannot have borders or frontiers. The evolution of the PVC industry and its sustainable development over the next decades, will be similar everywhere, with the same opportunities and the same challenges. Globalisation imposes a different way of thinking. Markets are global, issues are global, positive solutions and good practice can be exported to every point of the planet. For these reasons, the partnership between Vinyl 2010 and the other PVC regional associations, from North to South America, from Australia to the Asia-Pacific region, is ever more intensive and integrated. In August 2007 this resulted in the Asia Pacific Product Stewardship Conference, jointly sponsored by the World Chlorine Council, the Global Vinyl Council and the Asia-Pacific Vinyl Network in Bangkok, Thailand. More than 70 representatives from all over the world met to discuss sustainable development for the global and Asia-Pacific chlor-alkali and vinyl industries, with particular focus on key regulatory and policy issue, safety, environment and potential health issues for chlorine, EDC (Ethylene Dichloride), VCM (Vinyl Chloride Monomer) and PVC production, including discussions on Best Environmental Practices (BEP) and Best Available Techniques (BAT).

### Vinyl 2010 Sustainable Development Essay Competition

Vinyl 2010 is committed to dialogue on sustainable development. In partnership with a number of European universities, NGOs, student associations and media, in November 2007, it launched its first Sustainable Development Essay Competition intended to engage young people on the issues surrounding this very topical subject.

Contributions from citizens of the European Economic Area, aged between 18 and 30 were welcomed, responding to the question '*Are sustainable development and economic growth mutually exclusive?*'. The Essay Competition was judged by an independent Judging Panel of European sustainable development experts and Vinyl 2010 was delighted to receive a very high quality of entries giving fresh and inspiring views on sustainable development from young people from across Europe. The full set of entries are all being published in a book so that these views can be shared and discussed more widely.

### Stakeholder Events

To provide a forum for the exchange of views about its strategy, programme and initiatives, Vinyl 2010 hosted events during 2007 specifically dedicated to its stakeholders.

The first Stakeholder Networking Event was organised on 17 April, to coincide with the launch of the 2007 Progress Report. The event, held in the European Parliament Members' Dining Room was chaired by MEP and Member of the Vinyl 2010 Monitoring Committee John Purvis. Representatives of the European Commission and Members of the European Parliament attended together with several industry representatives and members of the Monitoring Committee.

Participants were invited to listen to presentations from Vinyl 2010 Secretary General Jean-Pierre De Grève, John Purvis MEP and special guest Monica Frassoni MEP. Monica Frassoni is head of the Green Group in the European Parliament and her frank views were successful in stimulating a lively debate among the participants.

The second Stakeholder Networking Event was organised on 5 December in Brussels and provided an important opportunity to officially introduce the new Vinyl Foundation payment mechanism to representatives from the European PVC converting industry. The event saw excellent participation from companies and associations as well as Monitoring Committee members, testifying to the strong commitment toward the achievement of the recycling targets.

### United Nations Partnership

As a registered Partnership with the Secretariat of the UN Commission on Sustainable Development, Vinyl 2010 attended the United Nations Session of the Commission on Sustainable Development (CSD-15) for the second consecutive year. The theme of the Session was policy options and practical measures to expedite implementation of energy for sustainable development, industrial development, air pollution/atmosphere and climate change.

Presenting in the Partnerships Fair Interactive Discussions on the theme of 'An effective partnership in the area of industrial development', Vinyl 2010 set out how the European PVC industry is moving towards sustainable development.

The Vinyl 2010 presentation can be accessed at:

<http://www.un.org/webcast/csd15/csd15-d.htm>  
(UN Webcast Archives – 3 May – Partnerships building cleaner industries for a sustainable future).

For a review of the event, please visit:

[www.un.org/esa/sustdev/csd/review.htm](http://www.un.org/esa/sustdev/csd/review.htm)

### Conferences and Exhibitions

During 2007, Vinyl 2010 was represented at:

- **Friend of Europe – Café Crossfire in Brussels, Belgium, 5 March.** As part of its partnership with Friends of Europe, Vinyl 2010 participated in the debate 'Can Self-Regulation Cut Through The EU's Red Tape' held in Brussels. The event was attended by representatives of the European Commission and European Parliament and from many industry groups and trade associations.
- **5<sup>th</sup> European Conference on Sustainable Cities and Towns in Sevilla, Spain, 21-24 March.** Organised by ICLEI – Local Governments for Sustainability, the conference saw the participation of over 1,500 delegates from European local governments. Vinyl 2010 was present with an exhibition stand to present its approach and achievements and promote Recovinyl's activities.

- **11<sup>th</sup> European Roundtable on Sustainable Production and Consumption in Basel, Switzerland, 20-22 June.** The Conference has become a key meeting point for leading European institutions, universities, research and technological centres focused on sustainable production and consumption. Vinyl 2010 participated with a presentation of the 2 Litre House project (an energy-saving and sustainable building approach), promoted and supported by the two Italian industry associations Centro di Informazione sul PVC (representing the PVC industry chain) and AIPE (representing EPS – expanded polystyrene producers).
- **LCM 2007, 3<sup>rd</sup> International Conference on Life-Cycle Management in Zurich, Switzerland, 27-29 August.** LCM is one of the biggest conferences worldwide in the field of environmental, economical and social sustainability. More than 400 participants from academic, political, and the scientific world attended the conference.
- **ISWA – International Solid Waste Association Congress in Amsterdam, the Netherlands, 24-27 September.** A Vinyl 2010 presentation on Recovinyl recovery and recycling schemes was received with interest by waste management specialists from around the world.
- **Sardinia 2007 – 11<sup>th</sup> International Waste and Landfill Symposium in Cagliari, Italy 1-5 October.** Organised by the University of Padua in collaboration with the Hamburg University of Science and Technology, the Sardinia Symposia are one of the most important global meetings on waste management issues. Vinyl 2010 presented papers on Recovinyl's experience and a study on PVC waste management in the Province of Rome.

## MILESTONES AND TARGETS

### Achievements and Results for 2007

#### Q U A R T E R 1

- ☒ **EPPA and TEPPFA:** integrate WUPPI-Denmark into Recovynyl ► **Achieved**
- ☐ **EPFLOOR:** develop new technologies in the UK ► **Not achieved**
- ☒ **ESPA:** publish 2006 statistics on PVC stabiliser tonnages ► **Achieved**

#### Q U A R T E R 2

- ☒ **PVC resin:** publish PVC Environmental Product Declaration (EPD) ► **Achieved in Q3 (S-PVC) and Q4 (E-PVC)**
- ☒ **EPPA and TEPPFA:** joint collection scheme in Spain: integration into Recovynyl ► **Achieved**

#### Q U A R T E R 3

- ☒ **Stewardship conference** in Asia under the auspices of Global Vinyl Council ► **Achieved**

#### Q U A R T E R 4

- ☒ **EPCOAT:** continue collection of post-consumer coated fabrics waste ► **Achieved**
- ☒ **Recovynyl:** have recycled 67,000 tonnes of PVC waste throughout year ► **Achieved**
- ☐ **Vinyloop®:** start-up of new decanter centrifuge ► **Postponed to Q2 2008 (the decanter was only delivered at the end of the year)**
- ☒ **Vinyloop®:** treat 7,200 tonnes of waste to produce 5,200 tonnes of R-PVC ► **Achieved**
- ☒ **EPFLOOR:** mechanical recycling pilot test in Sweden ► **Achieved**; identify recyclers in France ► **Achieved (survey carried out, but no recycler of post-consumer PVC flooring identified)**; recycle 2,200 tonnes of post-consumer flooring waste ► **Not achieved (2,529 of post-consumer flooring collected, but only 2,054 recycled)**

### Targets for 2008

#### Q U A R T E R 1

- **ESPA:** publish 2007 statistics on PVC stabiliser tonnages

#### Q U A R T E R 2

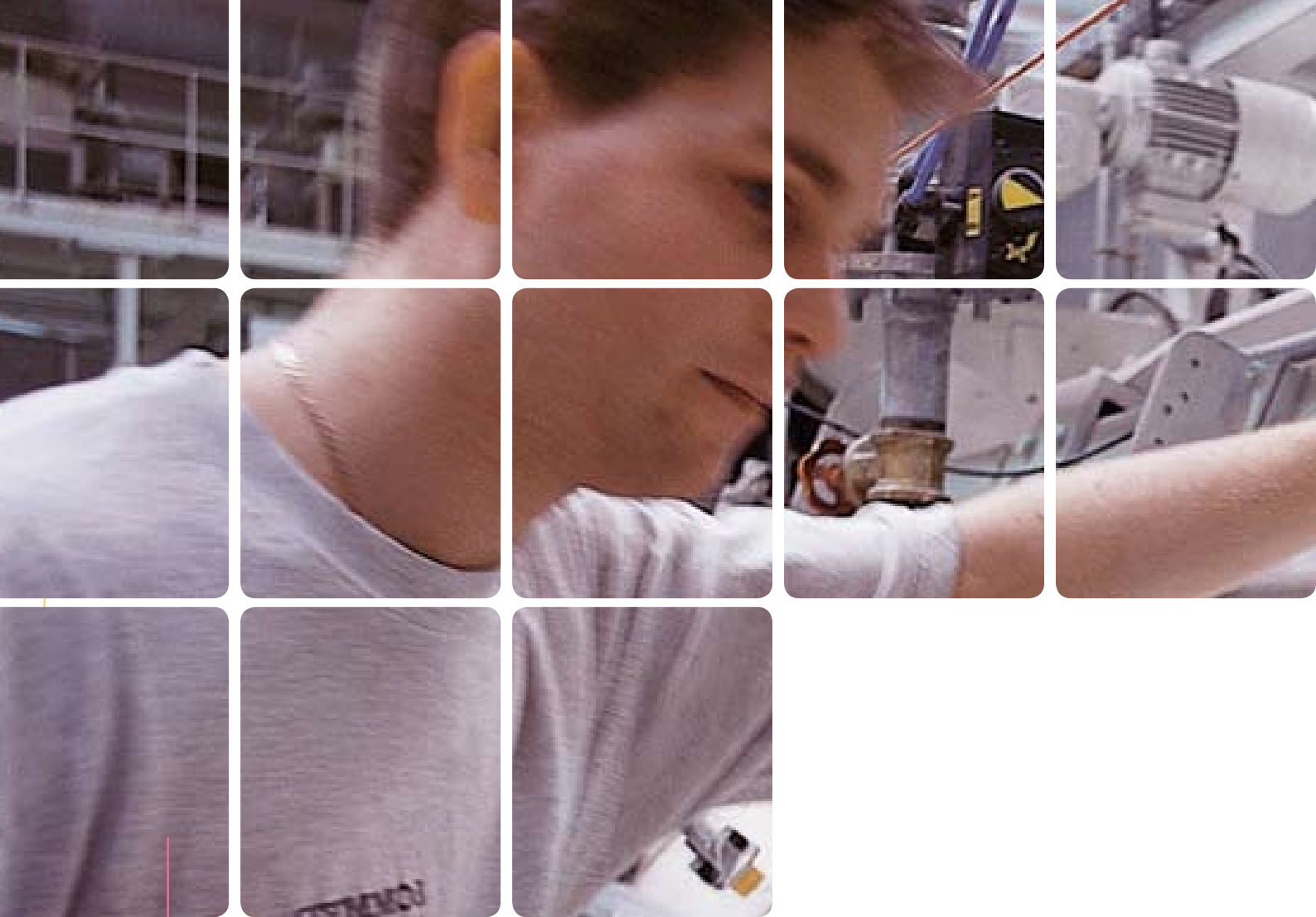
- **Vinyloop®:** start-up of new decanter centrifuge

#### Q U A R T E R 3

- **Texyloop®:** start-up of pilot plant

#### Q U A R T E R 4

- **Recovynyl:** ensure recycling of 130,000 tonnes of PVC waste throughout the year
- **EPFLOOR:** recycle 2,300 tonnes of post-consumer flooring waste
- **Vinyloop®:** treat 9,500 tonnes of waste to produce 6,800 tonnes of R-PVC



Production Technician  
Sweden



Hygienic, easily maintained surfaces

## PROJECT REPORTS

### PVC Resin Manufacturing

#### Health, Safety and Environmental Standards

In 2007 PVC monomer and resin manufacturers continued the well-established exchange of experience about incidents and near misses in order to further improve their safety record. They also continued monitoring their environmental performance with respect to the key parameters mentioned in the Best Available Technology Reference Document (BREF)<sup>6</sup>. A working group was set up to investigate a common assessment methodology for the levels of EDC and VCM around the production plants. Preliminary data show that these levels are already very low, which makes accurate measurements especially challenging.

#### Eco-Profile and Environmental Product Declaration (EPD)

In 2006, Vinyl 2010 contributed to updating the PVC Eco-Profile developed by PlasticsEurope<sup>7</sup> in previous years. The Eco-Profile is the basis of the Life-Cycle Assessment (LCA) referring to the environmental impact of a product/material. Whereas LCAs are cradle-to-grave analyses of the environmental impact of a product, Eco-Profiles stop at the factory gate ('Cradle-to-gate').

The PVC Eco-Profile can be downloaded from <http://lca.plasticseurope.org/main2.htm>

In 2007, based on the new PVC Eco-Profiles from 2006 the PVC industry developed 'Environmental Declarations' for Suspension-PVC (S-PVC) and Emulsion-PVC (E-PVC)\*. EPDs provide environmental impact data with indicators, for example on greenhouse gases as well as additional information such as on health aspects and performance. These EPDs describe the production of the S-PVC and E-PVC polymers. It is worth noting that they provide only environmental performance data,

but not the kind of information on the economic and social aspects which would be necessary for a complete sustainability assessment.

The aim of the PVC EPDs is to provide downstream users with data which can enable, for example, the production of subsequent product/application profiles and assessment, but they also provide reliable information on the material for academics and consultants carrying out further studies and research.

In line with the commitment to transparency undertaken by the PVC industry, the EPDs are public and regularly updated. The most recent updates can be downloaded from the ECVM website: [http://www.ecvm.org/img/db/EPDS\\_PVCFinal.pdf](http://www.ecvm.org/img/db/EPDS_PVCFinal.pdf) for S-PVC and at [http://www.ecvm.org/img/db/EPDE\\_PVCFinal.pdf](http://www.ecvm.org/img/db/EPDE_PVCFinal.pdf) for E-PVC.

In March 2007, also based on the new PVC resin Eco-Profiles and on information from converters, the Dutch research organisation TNO ([www.tno.nl](http://www.tno.nl)) initiated a study on 'Energy consumption and emissions of conversion processes'. The conversion processes considered for PVC are sheet calendaring, pipe and profile extrusion, film extrusion, injection moulding and spread coating (E-PVC). The study is expected for completion in Q2 2008.

*\* As PVC resin is a material and not a finished product, the term Environmental Declaration seems more appropriate for a correct definition. Nevertheless, the term Environmental Product Declaration (EPD) is widely used and recognised, and as such the PVC Environmental Declarations have been published.*



<sup>6</sup> The Polymers BREF was published in 2006 and it is available at <http://eippcb.jrc.es/pages/FActivities.htm>

<sup>7</sup> PlasticsEurope: Association of Plastics Manufacturers ([www.plasticseurope.org](http://www.plasticseurope.org))

## Plasticisers

Plasticisers are added to PVC resin to allow the production of a wide variety of flexible products ranging from medical tubing to flooring.

### Risk Assessments

The risk assessment of di-(2-ethylhexyl) phthalate (DEHP) was completed in 2006. The text was finalised in 2007 and its publication in the EU Official Journal is expected early 2008. A key conclusion from the risk assessment report is that there was no need for risk reduction measures beyond those which already were applied regarding exposure to DEHP for adult consumers. For children the risk assessment suggested a need to reduce exposure to DEHP from toys and child-care articles. However, this risk has subsequently been removed as a result of the introduction of Directive 2005/84/EC which prohibits the use of DEHP in toys and child-care articles in Europe from January 2007.

Measurement of the level of DEHP breakdown products in human urine shows that DEHP intake is low and does not cause any concern for the general population. In addition it was reported that it is safe to use DEHP in a large variety of indoor and outdoor applications (e.g. automotive, cables, leather cloth, footwear, flooring, roofing, etc.).

The RAR<sup>8</sup> has identified some concerns relating to the use of DEHP in medical equipment and SCENIHR<sup>9</sup> has been asked for its opinion on this use of DEHP, taking into account both the risks and benefits to patients. ECPI<sup>10</sup> has assisted this process by commenting extensively on the Preliminary Opinion.

Concern has also been expressed that emission of DEHP from converting plants could pose a risk to children living near such sites and eating food grown locally as well as to aquatic ecosystems and terrestrial ecosystems near such sites. This concern is only identified when using generic default emission estimates – there is no concern associated with sites having reported measured emission data.

Despite the hypothetical nature of these concerns ECPI is working with the converters (EuPC) and DG Enterprise to identify safe DEHP emission levels. These will be enforced to ensure that DEHP does not pose a risk to humans via the environment.

The requirement to limit the use of DEHP in food contact materials has already been addressed by Commission Directive 2007/19/EC amending Directive 2002/72/EC (Plastics materials intended to come into contact with food) which was published in the Official Journal on 31 March 2007. It states that DEHP may only be used in repeat use applications (tubes, conveyor belts, etc.) with non-fatty foods and with a Specific Migration Limit based on 50% of its tolerable daily intake.

The risk assessment for butylbenzyl phthalate (BBP) is still in progress. Publication is expected in 2008.

Phthalates like all other chemicals will be subject to the implementation of the European regulation REACH.

### Plasticiser Research

To support the extensive research on phthalates that already exists, ECPI has undertaken a major study on human volunteers. The purpose of the study is:

- Firstly, to generate a good quality DEHP conversion factor based on the approach of Koch et al.<sup>11</sup>, but with twenty subjects rather than one, thus over-coming the objections to the previous study.\*
- Secondly, to generate a conversion factor for a higher molecular weight phthalate, DINP. As there is currently no value for this substance, this is seen as an opportunity to generate a good quality value for this increasingly used phthalate.

The study was carried out at the end of 2007 and the data is currently being evaluated.

*\* The DEHP RAR recognises that, in order to calculate DEHP-intake from data on the urinary concentrations of DEHP-metabolites, there is a need for information from humans on what fraction of given DEHP is excreted as the different DEHP-metabolites in urine, i.e. the conversion factors for the different metabolites. There are three studies that can be used for deducing the conversion factors, and there are shortcomings with all of them.*

*The most reliable is the study by Koch et al (2004) and therefore the conversion factors obtained from that study are used in the EU risk assessment, together with urinary metabolite levels to calculate the exposure of the general population to DEHP. However, it is noted in the risk assessment that 'there is considerable uncertainty in this value as it is based on a conversion factor obtained from a single exposure of one individual.'*

<sup>8</sup> RAR: Risk Assessment Report

<sup>9</sup> SCENIHR: Scientific Committee on Emerging and Newly-Identified Health Risks

<sup>10</sup> ECPI: European Council for Plasticisers and Intermediates ([www.ecpi.org](http://www.ecpi.org))

<sup>11</sup> Koch HM, Bolt HM, Angerer J. Di(2-ethylhexyl)phthalate (DEHP) metabolites in human urine and serum after a single oral dose of deuterium-labelled DEHP. Arch Toxicol. 2004

### Availability of Information

Several websites cover all the themes related to the different families of plasticisers in the main European languages. The main websites are the Plasticisers Information Centre ([www.plasticisers.org](http://www.plasticisers.org)) and the Phthalates Information Centre ([www.phthalates.com](http://www.phthalates.com)).

### Stabilisers

Stabilisers are added to PVC to allow its processing and to improve its resistance to external factors including heat and sunlight (ultraviolet rays).

### Lead Replacement

In the Voluntary Commitment, ESPA<sup>12</sup> and EuPC committed to completely replace lead stabilisers by 2015 in the EU-15, with interim targets of a 15% reduction by 2005 and a 50% reduction by 2010. The commitment of 100% phase-out by 2015 was extended to the EU-27 in 2007.

The progressive substitution of lead-based stabilisers is ongoing and is confirmed by the corresponding growth in calcium organic stabilisers, which are used as an alternative to lead-based stabilisers.

In the period 2000-2007, lead stabilisers (in EU-15) decreased by 43,014 tonnes (-33.82%), and calcium organic stabilisers (in EU-15 plus Norway, Switzerland and Turkey) increased by 38,243 tonnes.

Tonnes of Stabiliser Systems	2000	2007	Reduction (%)
Formulated* lead stabilisers	127,156	84,142	33.82

\* Formulated means that these systems are complete stabiliser/lubricant packages and many also include pigments or fillers as a service to the customer. Their major use is in pipes and profiles for construction and electrical cables.

### European Production Data

The following table shows sales of other stabilisers in the EU-15 plus Norway, Switzerland and Turkey.

Tonnes of Stabiliser Systems	2000	2007
Formulated* calcium organic stabilisers e.g. Ca/Zn systems <sup>(1)</sup>	17,579	55,821
Tin stabilisers <sup>(2)</sup>	14,666	15,829
Liquid stabilisers - Ba/Zn or Ca/Zn <sup>(3)</sup>	16,709	18,124

\* Formulated means that these systems are complete stabiliser/lubricant packages and many also include pigments or fillers as a service to the customer.

<sup>(1)</sup> Includes food contact and medical applications, plus all lead replacement systems.

<sup>(2)</sup> Used primarily in rigid applications including food contact use.

<sup>(3)</sup> Used in a wide range of flexible applications, calendered sheets, flooring, etc.

### EU-27 Production Data

The stabilisers figures for the EU-27 are reported in the following table and will be reported from this year onwards.

Tonnes of Stabiliser Systems	2007
Formulated* lead stabilisers	99,991
Formulated* calcium organic stabilisers e.g. Ca/Zn systems <sup>(1)</sup>	62,082 <sup>(*)</sup>
Tin stabilisers <sup>(2)</sup>	16,628 <sup>(*)</sup>
Liquid stabilisers - Ba/Zn or Ca/Zn <sup>(3)</sup>	19,000 <sup>(*)</sup> <sup>(**)</sup>

<sup>(\*)</sup> EU-27 plus Norway, Switzerland and Turkey

<sup>(\*\*)</sup> EU-27 figure for liquid stabilisers is approximated. The reason is that under the rules of Cefic – the European Chemical Industry Council – statistics cannot be published if fewer than three companies are reporting. This is to avoid disclosure of individual information.

<sup>(1)</sup> Includes food contact and medical applications, plus all lead replacement systems.

<sup>(2)</sup> Used primarily in rigid applications including food contact use.

<sup>(3)</sup> Used in a wide range of flexible applications, calendered sheets, flooring, etc.

### Cadmium Phase-Out

Cadmium stabilisers were phased out in the EU-15 in 2001 by ESPA and EuPC. Following the EU enlargement, this commitment was extended to the EU-25 in the Voluntary Commitment revision of 2006.

The phase-out of cadmium was actually completed in the EU-27 by the end of 2007.

<sup>12</sup> ESPA: European Stabiliser Producers Association ([www.stabilisers.org](http://www.stabilisers.org))



## Stabilisers and REACH

The coming into force of the REACH regulation may pose some concerns for the future of PVC recycling, linked to the difficulties to identify all historical additives ever used in inhomogeneous post-consumer waste streams. This issue, which is particularly critical for post-consumer and industrial window profiles recycling, does not only affect PVC but all materials and is currently under evaluation in the framework of the REACH implementation.

The Voluntary Commitment sets the phase-out of cadmium and lead stabilisers, but also addresses the issue of recycled plastics still containing cadmium and lead stabilisers observing that 'Accepting recycling of applications containing cadmium and lead is the most sustainable way to avoid dissemination of these substances into the environment'.

## PVC Waste Management Sectoral Projects

### Recovinyl

Recovinyl is the organisation set up in 2003 within the framework of Vinyl 2010 programme with the aim of supporting and developing PVC waste collection and recycling schemes. Recovinyl has progressively integrated the collection and recycling initiatives previously directly managed by the EuPC sectoral projects.

With the help of financial incentives from Vinyl 2010, the Recovinyl system aims to ensure the Voluntary Commitment recycling target in Europe is reached by 2010. In 2006, it switched from a commercial activity to a non-profit association to strengthen its independence in the market.

Recovinyl facilitates the collection, sorting, dispatching and recycling of mixed PVC post-consumer waste, mainly from the building and construction sectors. Recovinyl does not collect or recycle itself, but utilises and motivates existing waste management organisations in the market. Recovinyl also provides financial incentives to support the collection of PVC waste from the building and construction sector. Vinyl 2010 believes that the Recovinyl system can contribute to making PVC recycling a mainstream and market-driven activity.

A dedicated website – [www.recovinyl.com](http://www.recovinyl.com) – has been created to facilitate Recovinyl's activities and to provide tools for registering waste volumes online. The site is now available in nine languages, and most of the modules are completed. Guidelines and contracts in nine languages are also available.

In 2007, Recovinyl increased its activities in several European countries and confirmed the effectiveness of the process with a huge increase of recycled volumes reported. High raw material prices increased the demand for recyclates with a consequent increase in demand of post-consumer PVC waste and in investments for recycling it. Availability of post consumer PVC waste seems to be still affected by exports to Eastern Europe and the Far East. The reuse of post-consumer products is also perceived as a growing trend by waste management organisations in the market.

Since 2005, the registered recycled volumes increased from 14,000 to 111,322 tonnes, due in particular to the progress made in Germany and the UK.

Recovinyl is now active in nine countries – Belgium, Denmark, France, Germany, Italy, Ireland, the Netherlands, Spain and the UK – and started evaluation activities in Central Europe (the Czech Republic, Hungary, Poland and Slovakia). Plans have been developed to extend its activity towards Austria and Sweden.

Until 2006, Recovinyl's programme only supported rigid PVC applications. But in 2007, this was extended to flexible PVC applications.

In the Benelux, Recovinyl has 13 certified recyclers. In the Wallonia region of Belgium, there are 3 interregional waste collectors which joined the Recovinyl programme. In France, further integration with PVC Recyclage (CIFRA) took place and a survey of the existing 15 recyclers showed a potential for an additional 5,000 tonnes/year for flexible applications.



In Germany, a local agent was appointed to map existing recyclers. A potential 30 recyclers were under evaluation, wherefrom 25 are currently certified. The registered volume increased from 5,522 tonnes in 2006 to 35,925 tonnes in 2007. In the UK, a strong contribution was given by the development of flexible PVC recycling with 3 major recyclers/converters collecting material from Italy, Germany and the Netherlands.

In Italy a further 10 recycling companies are ready to join the programme. In Spain, the activity concentrates on a roller shutter project, and a local agent started the mapping of recyclers.

In 2007, Recovinyl started to develop its activities in Central Europe with an initial contribution of over 1,890 tonnes.

#### Recovinyl Registered Recycled Volumes per Country

	Year 2005*	Year 2006*	Year 2007*
Belgium	1,500	2,739	1,954
Denmark	-	-	2,896
France	2,000**	7,446	13,276
Germany	-	5,522	35,925
Ireland	-	251	-
Italy	-	828	4,252
Netherlands	4,500	10,972	8,959
Spain	-	2	-
Sweden	-	94	-
UK	8,000	16,836	42,162
Central Europe	-	-	1,896
<b>TOTAL</b>	<b>16,000</b>	<b>44,690</b>	<b>111,322</b>

\* Actual figures in tonnes

\*\* This volume was recycled by PVC Recyclage, now included in Recovinyl

#### Recovinyl Registered Recycled Volumes per Application

Year 2007\*

##### RIGID PVC APPLICATIONS

Pipes	18,375
Profiles	39,517
Rigid Films	2,134

**TOTAL RIGID PVC APPLICATIONS 60,026**

##### FLEXIBLE PVC APPLICATIONS

Cables	37,469
Mixed	13,827

**TOTAL FLEXIBLE PVC APPLICATIONS 51,296**

\* Actual figures in tonnes



#### Window Profiles

EPPA<sup>13</sup>, like the other EuPC sectoral projects, is increasingly integrating its activities with Recovinyl, to improve common schemes for collection and recycling. Window collection and recycling schemes are well established in Austria and Germany, and systems are in place in Belgium, Denmark, France, Ireland, Italy, the Netherlands, Spain and the UK with Recovinyl.

<sup>13</sup> EPPA: European PVC Window Profile and Related Building Products Association, an EuPC sector group ([www.eppa-profiles.org](http://www.eppa-profiles.org))

### National Developments

In Germany, Rewindo (Germany's largest clearing house for post-consumer PVC windows – [www.rewindo.de](http://www.rewindo.de)), continued its successful waste acquisition concept, collecting 14,324 tonnes in 2007. The output material from recycled windows was used completely in new applications (approx. 50% in window profiles, 10% in window-related applications and 40% in other building applications).

According to data collected by Consultic ([www.consultic.de](http://www.consultic.de) – 2007), an additional 1,474 tonnes of rigid PVC recyclate should be considered in Germany, originating from other rigid post-consumer window recycling activities and therefore are not included in the Rewindo figures.

In addition, the PVC in PVC windows being re-used represents approximately 4,000 tonnes per year.

The Austrian organisation ÖAKF ([www.fenster.at](http://www.fenster.at)) concentrated its successful efforts on communication to push recycling activities and confirmed a continuous increase in volumes.



### Pipes and Fittings

2007 saw good cooperation between TEPPFA<sup>14</sup> and Recovinyl and EPPA and almost all the national initiatives are now integrated into the Recovinyl system, even though in certain countries, like for example Spain, the achieved integration could not be exploited to its full potential yet and the level of activities remains low.

A joint TEPPFA/EPPA enquiry on lead replacement showed that most converters face similar technical problems in products and production processes in introducing non-lead additives. The consequences include an increase in production costs due to lower production efficiency and the requirement for significant investments in R&D and in production.

Activities aiming at the complete replacement of lead stabilisers in drinking water pipes in Greece, Portugal and Spain were pursued in 2007.

### Roofing Membranes

In 2007 ESWA<sup>15</sup> recycled 6,627 tonnes through its project Roofcollect®, well exceeding its target of 2,520 tonnes.

As Recovinyl extended its activities to flexible PVC in 2007, synergies with Roofcollect® were developed. In this framework, Roofcollect® successfully transferred its Registration System to Recovinyl and for this reason the volumes accounted in the sectoral project in 2007 are apparently lower than those achieved in 2006.

The Roofcollect® collection system saw a continuous improvement in 2007, extending its geographic scope. In terms of recycling facilities, satisfactory alternatives to Stigsnaes and Vinyloop® were found at the companies Hoser and KVS and new recyclers were utilised in the Czech Republic (Ekotrend), France (Chaize) and Hungary (Mikrolin).

In 2007, Roofcollect® reinforced its marketing activities in Germany with new communications tools, media relations and workshops. A poster for the Roofing Contractor Wholesalers Association was also created for circulation to over 100 associated companies.

At national level, the Roofcollect® activity focused also on logistics groups involving experts from both collecting and recycling companies, with meetings organised in Germany, England and for Nordic Countries (Norway and Sweden) and through Interseroh in Austria, Germany and Italy.

<sup>14</sup> TEPPFA: European Plastic Pipes and Fittings Association, an EuPC sectoral association ([www.teppfa.org](http://www.teppfa.org))

<sup>15</sup> ESWA: European Single Ply Waterproofing Association, an EuPC sectoral association ([www.eswa.be](http://www.eswa.be))



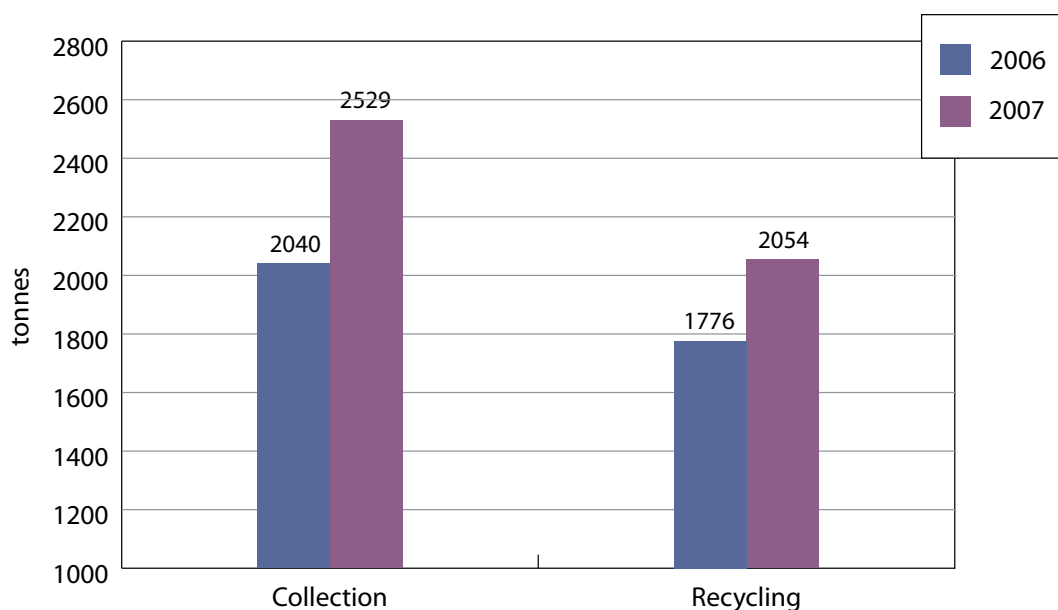
### Flooring

Despite the difficulties experienced in waste collection, EPFLOOR<sup>16</sup> increased both collection (by 24%) and recycling (by 15.6%) volumes in 2007, with a final result of 2,054 tonnes recycled, close to the fixed target of 2,200 tonnes.

AgPR<sup>17</sup> saw its collection figures decrease in the first half-year due to a fall in waste incineration prices in Germany. The situation improved in the last quarter though, after AgPR changed its gate fee conditions and multiplied its contacts and promotions towards waste collectors. Overall the collection in 2007 increased by 8%.

In the UK, the collection of post-installation flooring has improved. A collecting system has been set up by the PVC flooring manufacturers in cooperation with the installers of the flooring by making containers available for collection of further flooring material. The effort is supported by an increased pressure from end-users on the installers and on the flooring manufacturers to guarantee that the waste generated (both installation waste and old flooring) will be collected and recycled. This has even become a common contractual requirement in new projects.

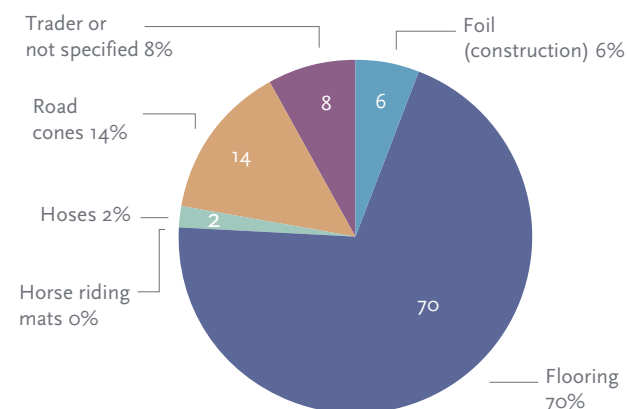
EPFLOOR Collection and Recycling in the EU-15, Switzerland and Norway in 2006 and 2007



<sup>16</sup> EPFLOOR: European PVC Floor Manufacturers, an EuPC sectoral group ([www.epfloor.eu](http://www.epfloor.eu))

<sup>17</sup> AgPR: Association for PVC Floor-covering Recycling ([www.agpr.de](http://www.agpr.de))

### Sales per Application of Recyclate from Post-Consumer PVC Flooring Recycling in 2007



In 2007, collection increased significantly (up to 282 tonnes) in France due to the cooperation with large flooring installation companies, waste collectors (Paris, Brittany, Burgundy) and social housing refurbishment projects. SFEC (the French Association of Calenderers) was also very active in communicating to raise awareness on the recycling issue. To identify recyclers, a survey was carried out in France, but unfortunately no recycler for post-consumer PVC flooring was found.

In Sweden, a pilot project of mechanical recycling was initiated in 2007 and waste collection activities have been performed. The project will continue in 2008.

Due to the takeover of the recycling partner by a new owner, the foreseen tests into the processing of safety flooring in the UK were not carried out. EPFLOOR believes that safety flooring recycling will remain at a low level until new and more effective recycling processes are found and will therefore continue to actively cooperate with Vinyl 2010 in the development of new recycling solutions.



### Coated Fabrics

The EPCOAT<sup>18</sup> project is aimed at evaluating the feasibility of recycling waste from the European PVC coated fabrics sector (tarpaulins, tents, marquees, advertising panels and artificial leather) which is participating in the recycling targets of Vinyl 2010. It includes investigation of collection and market aspects and screening and practical trials of collection systems and available recycling technologies.

In 2007 the sector had to face several challenges such as the quality of available waste with a lower percentage of PVC used in coated fabrics and increases in gate fees of some recycling plants. For these reasons the estimated volumes of recycling achieved (2,609 tonnes) were below the target of 3,500 tonnes.

A study completed in 2005 showed that synthetic or artificial leather is a significant market for PVC coated fabrics and so is a potentially major source of recyclable post-consumer waste. It is estimated that 65,000 tonnes per year of PVC artificial leather is consumed annually (excluding automotive applications). The French-based calendering and coated fabric trade association, SFEC, intends to explore the potential of different artificial leather markets as sources of collectable, clean PVC waste, but it is too early to report on its progress.

<sup>18</sup> EPCOAT: EuPC PVC Coated Fabrics Sector Group ([www.euipc.org/epcoat](http://www.euipc.org/epcoat))

## PVC Waste Management: Recycling Technologies, Plants and Projects

### Vinyloop®

Vinyloop® is a mechanical recycling technology using solvents to produce high quality R-PVC (recycled PVC) compounds.

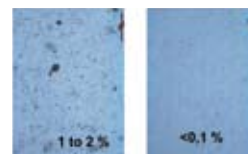
In 2007 the Vinyloop® technology confirmed its enormous commercial potential, with the demand for R-PVC continuously growing and exceeding the actual production capacity.

Considerable efforts are still required in order to improve the on-stream factor\*, reduce production costs, use different PVC waste other than cables and improve the quality of the R-PVC.

Although the secondary filter plate did not give the expected performance and there was a delay in the installation of a new decanter centrifuge (which is in fact unique in the world and was delivered late at end-2007), the plant performed well, processing 8,191 tonnes of PVC waste, almost 14% over the target.

### Decanter Centrifuge Impact

Reduced filler content	
Filter	Decanter Centrifuge
30%	0.3%



Current filter

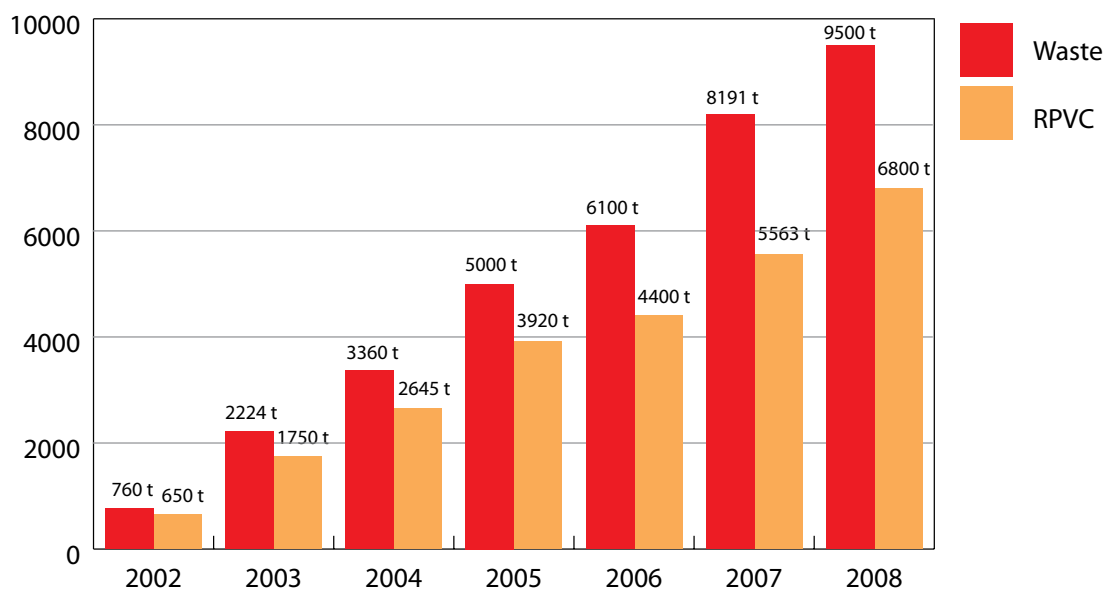
Decanter Centrifuge

Increased performance was due to new measures taken in 2007:

- a new density separation table downstream (which improves the separation of copper from cables);
- closer cooperation with cable recyclers;
- sourcing higher quality waste.

\* The ratio of the number of operating days to the number of calendar days per year

### Vinyloop® Ferrara Plant Perspectives





The Taxyloop® technology could present a solution for the treatment of tarpaulins, and depending upon the availability of waste also for other fibres containing PVC waste.

The start-up of the pilot module, with a capacity of 2,000 tonnes, foreseen in the second half of 2007, was postponed to 2008, due to the delay in obtaining the new decanter centrifuge, which is an essential pre-requisite for Taxyloop®.

The second Vinyloop® plant with a capacity of 18kt started up in Japan, operated by Kobelco Vinyloop® East Co. is up and running. But the plant is currently only performing at 50% of its capacity due to the lack of collected waste.



#### **Halosep®**

The Halosep® process was designed with assistance from Vinyl 2010 to make use of the flue gas residues generated during the incineration of waste containing chlorine.

The process has successfully completed the trial phase, and the new owner, Danish company RGS 90, is still looking for partners to build a demonstration plant of commercial size.

#### **Sustec Schwarze Pumpe GmbH (SVZ)**

The technology proposed by the German company Sustec Schwarze Pumpe GmbH (SVZ), was focused on a gasification plant for fluid and solid kinds of waste.

Although SVZ could accept waste with a chlorine content of up to 10%, this solution did not convince the market because of the existence of cheaper solutions, and in 2007 SVZ ceased operations.

#### **Sumitomo Metal Feedstock Recycling Process**

The possible use in Europe of a feedstock recycling process based on Sumitomo Metal gasification technology is currently under evaluation.

Vinyl 2010 is trying to identify a suitable location for a 30kt plant in Europe. The location should guarantee on-site consumption of syngas and local consumption of HCl (the by-products generated by the recycling of waste containing PVC). The options under evaluation include two potential sites in Germany, while in France and Belgium the company Fairtec (Suez Group) was asked to identify other suitable sites.

At the moment, German sites seem to meet reasonably the technical requirements, but some economic and strategic concerns still remain in terms of partnership for ownership, waste acquisition/delivery and selling the produced HCl.

According to the Fairtec study, the French options showed some technical issues (technology may need further development/adaptation) and like in the case of the German sites some strategic issues concerning funding and technical contribution by Vinyl 2010.

## PVC Waste Management: Other Projects

### CIFRA

The French producer of calendered PVC CIFRA, with the financial support from Vinyl 2010, set up a recycling facility to recycle PVC scraps from cooling towers and from demolition sites. In 2007, the volumes of PVC recycled within the CIFRA project were certified by Recovinyl.

### APPRICOD – ACR+

The APPRICOD<sup>19</sup> project aimed at 'Assessing the Potential of Plastic Recycling in the Construction and Demolition Activities' ended in 2006, but the guide *Towards Sustainable Plastic C&D Waste Management in Europe* and the information leaflets realised in several languages were used also in 2007 in the framework of Vinyl 2010 communications activities with stakeholders.

APPRICOD, a successful example of cooperation with local authorities, was the follow-on from a pilot project started in 2001 by Vinyl 2010 and the Associations of Cities and Regions for Recycling and Sustainable Resource Management (ACR+, formerly ACRR).

### REACH and Recycling

Following the recommendation of the Monitoring Committee, Vinyl 2010 will initiate an impact assessment of possible options to reconcile recycling of waste containing certain types of additives with the restriction provisions of the REACH regulation.

Vinyl 2010 may benefit from a study on assessing the impact of REACH on the recycling of plastics in Germany. The study, which involves PlasticsEurope Germany, converters, waste management companies, authorities and some of the application sectors, is scheduled to start in February 2008 and end in July 2008.

The study will use five different scenarios (e.g. recycling of mixed plastics post-consumer waste) to report on: existing recycling processes and impact of REACH on these; recommendations for an effective REACH implementation; assessment of the REACH impact on the plastics recycling business.

### Vinyl Foundation

Meeting the targets set up for collection and recycling of PVC waste is a key element of the PVC industry's Voluntary Commitment. Vinyl 2010 is well on track to achieve its targets, due in particular to the impressive results provided by the Recovinyl system and the sectoral projects.

To spread the costs more fairly across the whole PVC value chain, a new initiative, the Vinyl Foundation, has been set up by EuPC with the assistance of Vinyl 2010 to collect funding contributions from all PVC converters. This will include those not represented in the industry associations.

The Vinyl Foundation is a non-profit independently-managed trust which provides a mechanism to fairly collect contributions from the whole European converting industry. The accountancy firm KPMG has been appointed to operate a confidential 'black box' system and independently administrate the collection of funds on behalf the Vinyl Foundation.

Raw material producers will provide data to KPMG on the tonnage of PVC sold to their customers. KPMG will process this data in complete confidentiality and issue payment requests to converters, compounders and traders on behalf of the Vinyl Foundation. All information will be handled in the strictest confidence, in full compliance with the EU competition laws.

Packaging applications which are already covered by EU recycling schemes and export volumes are exempt from the contribution.

Vinyl 2010 believes that the Vinyl Foundation will build on the solid progress made by Vinyl 2010 and ensure that it reaches its full potential.

<sup>19</sup> APPRICOD: Assessing the Potential of Plastics Recycling in the Construction and Demolition Activities ([www.appricod.org](http://www.appricod.org))



# Per and Lene

Automation Maintenance Engineers  
Norway



Flexible, comfortable protection



## FINANCIAL REPORT

Expenditure by Vinyl 2010, including EuPC and its members amounted to €7.68 million in 2007, up from €7.09 in the previous year.

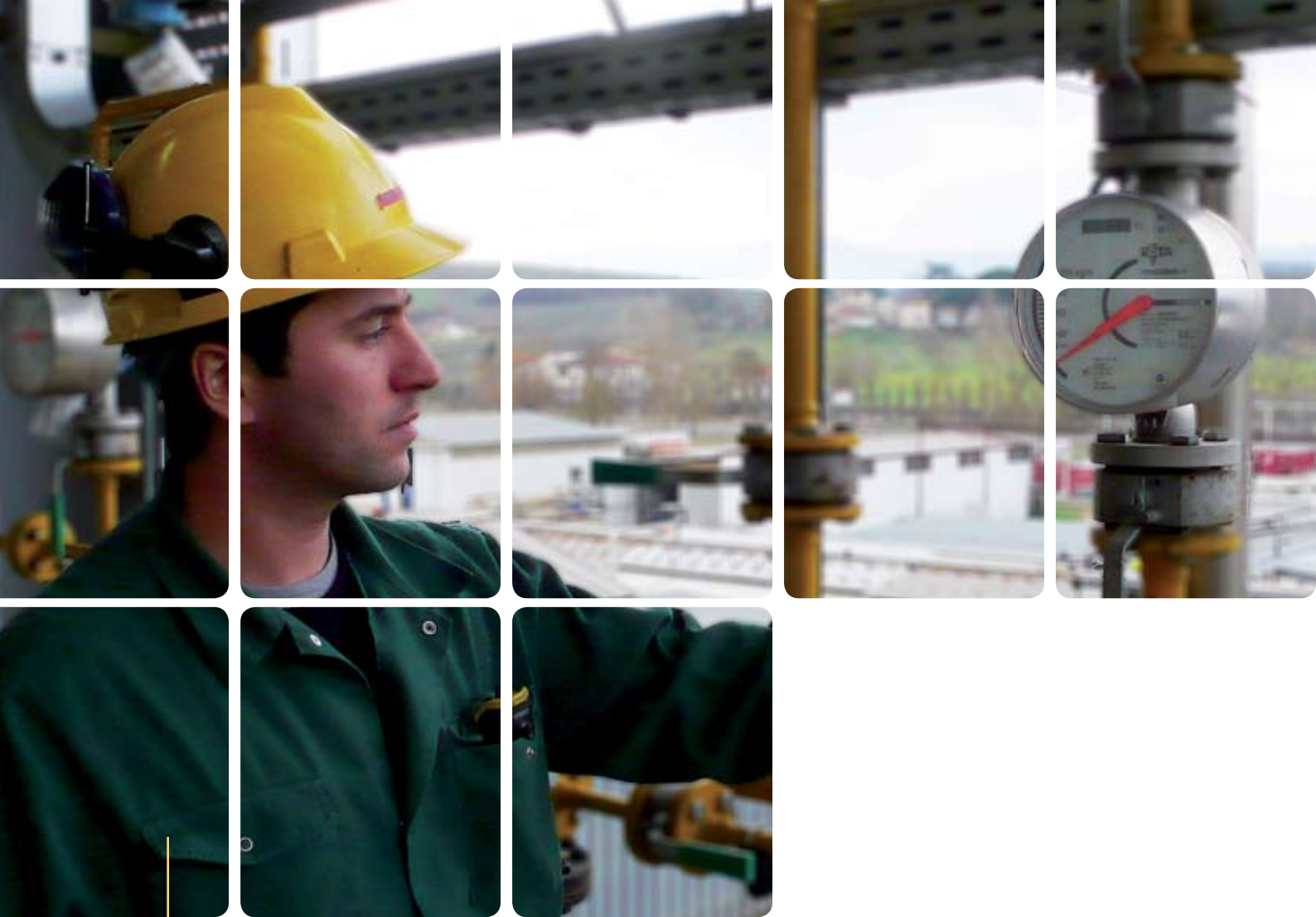
Whilst the cost of sectoral projects remained stable or decreased, the cost of the Recovinyl project increased due to the integration of sectoral activities and Recovinyl more than doubling its registered recycled volume.

Vinyl 2010 continued to support the development of the Vinyloop® technology with €1 million.

Vinyl 2010 – Waste Management Projects Figures in 1,000s Euros	Total expenditure in 2007 including EuPC and its members	
	2007	2006
ACR+/APPRICOD	0	16
Enlargement Project	0	1
EPCOAT	292	292
EPFLOOR	747	740
EPPA	605	794
ERPA/CIFRA	0	250
ESWA/ROOFCOLLECT®	375	499
Halosep®	0	21
Light Concrete Italy*	0	-10
Recovinyl and Synergy Project	4,513	2,995
Studies	13	14
TEPPFA	134	475
Vinyloop® Ferrara	1,000	1,000
<b>TOTAL</b>	<b>7,679</b>	<b>7,087</b>

\* The small negative figure corresponds to the reimbursement of unused funds at the end of the project





## Dario

Shift Superintendent  
Italy



Tough, durable and smooth; but with enough flexibility to resist impacts

# VERIFICATION STATEMENTS

## KPMG Certification of Expenditure

### Independent Accountants' Report on Applying Agreed-Upon Procedures

To the Management of Vinyl 2010

We have been appointed by Vinyl 2010 in order to perform a verification of the table presenting the supported charges for the different projects of Vinyl 2010, as included in the Vinyl 2010 Progress Report related to the activities of the year 2007. We confirm that we belong to an internationally-recognised supervisory body for statutory auditing.

We have performed the procedures enumerated below solely to assist you in certifying the table presenting the supported charges for the different projects of Vinyl 2010, as included in the Vinyl 2010 Progress Report related to the activities of the year 2007. Vinyl 2010's management is responsible for the overview, analytical accounting and supporting documents. This agreed-upon procedures engagement was conducted in accordance with attestation standards established by the International Standards on Related Services. The sufficiency of these procedures is solely the responsibility those parties specified in this report. Consequently, we make no representation regarding the sufficiency of the procedures described below either for the purpose for which this report has been requested or for any other purpose.

#### Procedure

Obtain the total amount of costs declared in the table presenting the supported charges for the different projects of Vinyl 2010, as included in the Vinyl 2010 Progress Report related to the activities of the year 2007 and ensure, on a sample basis, compliance with the following cumulative conditions:

- The costs are determined in accordance with international accounting principles (IAS/IFRS);
- The costs were incurred between January 1<sup>st</sup>, 2007 and December 31<sup>st</sup>, 2007;
- The costs are recorded in the accounts of the contractor no later than December 31<sup>st</sup>, 2007.

Our procedures did not address completeness of income and expenses.

#### Findings

The total amount of the expenses is K€7,679

- The sample size covers all individual costs above €100 of the total amount of costs. Based on this sample size, there were no findings.
- The sample size covers all individual costs above €100 of the total amount of costs. Based on this sample size, there were no findings.
- The sample size covers all individual costs above €100 of the total amount of costs. Based on this sample size, there were no findings.

We were not engaged to, and did not, conduct an examination, the objective of which would be the expression of an opinion on overview, analytical accounting and supporting documents. Accordingly, we do not express such an opinion. Had we performed additional procedures, other matters might have come to our attention that would have been reported to you without prejudice to the current organization.

This report is intended solely for the information and use of the management of Vinyl 2010, and is not intended to be and should not be used by anyone other than these specified parties.

**KPMG Bedrijfsrevisoren burg. CVBA – Réviseurs d'Entreprises SCRL civile**



represented by  
**Dominic Rousselle,**  
Partner

Louvain-la-Neuve, March 21<sup>st</sup>, 2008



## KPMG Certification of Tonnages

### Cvba Klynveld Peat Marwick Goerdeler Advisory Scrl

Report of the independent expert concerning the audit of the tonnages non regulated post-consumer PVC waste collected and recycled in 2007 by the sector groups EPCoat, EPFLOOR and EPPA of the EuPC, by the sector associations ESWA & TEPPFA of the EuPC, by the subsidized recycling plants CIFRA and Vinyloop Ferrara S.p.A. and by Recovinyl Inpa during the period between 1<sup>st</sup> January 2007 and 31<sup>st</sup> of December 2007.

In accordance with the assignment, which was entrusted to us by Vinyl 2010, we give an account of our audit of the following tonnages for the different projects of Vinyl 2010 mentioned in the Vinyl 2010 Progress Report related to the activities of the year 2007.

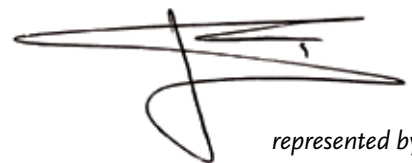
The conclusions of this audit are summarized in the below-mentioned overview:

Project	Type of PVC post-consumer waste	Tonnage recycled in 2006	Tonnage recycled in 2007	% Increase
EPCoat	Coated fabrics	2,804*	2,609*	-6.95%
EPFLOOR	Flooring	1,776*	2,054*	15.65%
EPPA (incl. Recovinyl and Vinyloop Ferrara)	Window profiles & Window-related profiles	37,066	56,046	51.21%
ESWA (/ ROOFCOLLECT) and (only for 2007) Recovinyl	Flexible PVC	10,504*	20,454*	94.73%
TEPPFA (incl. Recovinyl)	Pipes & fittings	10,841	21,236	95.89%
Recovinyl (incl. CIFRA)	Rigid PVC film	1,641	2,135	30.10%
Recovinyl and Vinyloop Ferrara	Cables	18,180	44,929	147.13%
<b>Total</b>		<b>82,812</b>	<b>149,463</b>	<b>80.48%</b>

\* Tonnage including Norway and Switzerland

The persons responsible for establishing the table presenting the supported tonnages for the different projects of Vinyl 2010 have provided us with all explanations and information which we required for our audit. Based on our review of the information provided, we believe that all waste that was taken into account was non regulated post-consumer PVC waste, according to the Vinyl 2010 definition of non regulated post-consumer PVC waste and that we have not recognized any elements which are of nature to influence significantly the presented information.

### Cvba Klynveld Peat Marwick Goerdeler Advisory Scrl



represented by  
**Ludo Ruysen,**  
Partner

Brussels, March 20<sup>th</sup> 2008

## DNV Verification Statement – 2008 Progress Report

DET NORSKE VERITAS (DNV) IS AN INDEPENDENT FOUNDATION ESTABLISHED IN 1864 WITH THE PURPOSE OF SAFEGUARDING LIFE, PROPERTY AND THE ENVIRONMENT.

DNV was for the seventh time commissioned by Vinyl 2010 to provide an independent verification of the 2008 Progress Report. The 2008 Progress Report presents the achievements made by the Vinyl 2010 project in 2007 related to the 10-year programme.

The purpose of the verification was to check the statements made in the report. This verification statement represents our independent opinion. DNV was not involved in the preparation of any part of the Progress Report or the collection of information on which it is based.

### Verification Process

The verification consisted of checking whether the statements in the Report give an honest and true representation of Vinyl 2010's performance and achievements. This included a critical review of the scope of the Progress Report and the balance and the unambiguity of the statements presented.

#### The verification process included the following activities:

- Desk-top review of project-related material and documentation made available by Vinyl 2010 such as plans, agreements, minutes of meetings, presentations, technical reports and more.
- Communication with Vinyl 2010 personnel responsible for collecting data and writing various parts of the report, in order to discuss and substantiate selected statements.

#### The verification did not cover the following:

- The underlying data and information on which the desk-top review documentation is based
- The tonnage of PVC waste recycled (verified by KPMG)
- The chapter Financial Report (verified by KPMG)
- The chapter KPMG Certification

## Verification Results

It is our opinion that the *Vinyl 2010 2008 Progress Report* represents Vinyl 2010's achievements in 2007 in a fair and honest way. The report reflects in a balanced way the PVC industry's effort to comply with its revised commitments in the *Voluntary Commitments of the PVC Industry of May 2006*.

There are not defined any key milestones for 2007 in the *Voluntary Commitments of the PVC Industry of May 2006*. However, specific targets for 2007 were established in the *Vinyl 2010 2007 Progress Report*. Most of these targets are achieved, and great effort has been done by the industry to meet its commitments by 2010.

Strong performance has been demonstrated also this year with the recycled tonnages of PVC waste, particularly through the successful Recovinyl project. The recycled volume of wastes has increased to a level of 66% above the target for 2007, and a number of sectoral projects have been integrated by involving new recyclers and waste management companies. However, it may be demanding to keep the progress towards the final target for 2010.

A continuous substitution of lead-based stabilisers is going on, which is confirmed by the corresponding growth in calcium organic stabilisers. However, a great effort will be required by the industry to achieve the extended commitment of 100% phase out in EU-27 by 2015.

A key milestone for the industry was to complete risk assessments for five commonly used phthalates by 2005. In 2007 risk assessments for four out of five phthalates were completed. One risk assessment has been delayed and is expected to be published in 2008.

It is DNV's opinion that the European PVC industry has established a sound basis for meeting its obligations in the Vinyl 2010 programme. Eight years with comprehensive work demonstrates the industry's willingness to meet its commitments within environmental sustainability. It should also be mentioned that the industry shows an open and proactive attitude to encourage an ongoing dialogue with its stakeholders.



**Birgit Hammerseng**  
Project Manager

# VINYL 2010 AND ITS MEMBERS

Vinyl 2010 represents the whole PVC industry chain. Its four founding members are:



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